

Regional Greenhouse Gas Initiative (RGGI)
Frequently Asked Questions on the Economic Analysis
Prepared by New Hampshire Department of Environmental Services
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1. Background

The Regional Greenhouse Gas Initiative, commonly referred to as RGGI, is a regional effort to achieve reductions in carbon dioxide (CO₂) emissions from power plants 25 megawatt (MW) and greater in ten Northeast and Mid-Atlantic states in order to address climate change. The reductions are achieved via a flexible market-based mechanism commonly referred to as “cap and trade”, in which total emissions from affected facilities are limited, or capped, at an initial level and the cap is reduced over time. The states issue “allowances” (i.e. the right to emit one ton of CO₂) in an amount equal to the total capped emissions, and allocate those allowances to individual states in proportion to their emissions. Facilities can either make reductions themselves or purchase allowances from an allowance market system. The demand for allowances sets a market price, and the cost of allowances will encourage facilities to make additional reductions.

The cap is initially set at a modest limit, reflective of current emissions, and reduced further over time. Total emissions in the RGGI states may not increase from 2009 to 2014, and then must fall by 2.5 percent per year through 2018, so that by 2019 they must be at least 10 percent below the projected 2009 level. Modeling forecasts suggest that without RGGI, emissions from power plants in the region would grow by 7 percent from 2009 to 2019. Thus, compared to “business as usual,” RGGI is designed to cut emissions by around 17 percent.

Professor Ross Gittell of the University of New Hampshire was asked to conduct an analysis (the UNH study) of the economic impact of state participation in RGGI to support the consideration proposed legislation implementing RGGI in New Hampshire. The primary conclusion of the study is that New Hampshire overall will economically benefit by participating in RGGI, if the proceeds from the sale of allowances allocated to the state are reinvested in energy efficiency measures to reduce demand. This document addresses questions received by DES and/or UNH regarding the analysis.

The document will be updated as necessary to include further questions or issues.

2. Questions relative to the University of New Hampshire’s Preliminary Findings on the Economic Impact of New Hampshire’s Participation in the Regional Greenhouse Gas Initiative (UNH Study)

2.1 Will New Hampshire rate payers be affected if New Hampshire doesn’t join RGGI?

RGGI is a regional cap and trade program to limit power plant emissions of carbon dioxide. Electricity costs will increase in New Hampshire even if the State were not to participate in RGGI. This is because all of the utilities in the State purchase competitively generated power from the New England marketplace. If New Hampshire were not to join RGGI, it would not receive the economic value from

the allowances allocated to it under RGGI, but would still experience the increased cost of RGGI in regional wholesale power prices.

The costs of RGGI will primarily be borne by ratepayers no matter how carbon allowances are allocated. If New Hampshire joins RGGI, the costs of RGGI are expected to increase the electric utility bills of New Hampshire customers by \$20 million (if \$2 carbon allowance price) in 2009 rising to \$88 million (if \$8 carbon allowance price) in 2018. If New Hampshire were not to participate in RGGI, electricity costs would increase to a lesser degree, \$7 million in 2009 rising to \$36 million in 2018. However, the revenue expected from auctioning carbon allowances with RGGI participation more than offsets the added cost of joining RGGI.

The state would expect to receive allowances valued at \$17 million in 2009 rising to \$62 million by 2018. These funds could be used to help address the increased cost of RGGI to electricity customers through rebates or funding energy efficiency. These funds could also be put to other purposes by the State.

2.2 Given that the regional energy market will be affected with or without New Hampshire participation in RGGI, will New Hampshire still bear the cost of RGGI even if a significant portion of New Hampshire's power comes from PSNH and most of PSNH's power is self-generated?

PSNH customers will face some increased costs whether or not the state participates in RGGI, since approximately one-third of PSNH power is purchased on the regional wholesale power market. PSNH customers will have less of a cost increase if New Hampshire does not join RGGI than if the state participated in RGGI. For the other New Hampshire utilities customers, the cost increases expected are the same whether or not New Hampshire joins RGGI.

For utility customers (both PSNH and other New Hampshire utility customers) increased costs are minimized if all allowance revenue were to be dedicated to ratepayer benefit. Cumulative costs would be minimized if 100 percent of allowance revenue went to energy efficiency. In the short term, utilizing allowances to directly rebate customers would have the most significant reduction on rates, but over the long term would result in higher costs than investment in energy efficiency. Energy efficiency investment would have the lowest short term rate impact, but over the long term would result in lower costs than rebating.

2.3 How much of the increased costs from participating in RGGI can be offset by generating revenues from the auction of allowances?

If New Hampshire chose to rebate 100 percent of auction revenue to utility customers, PSNH customers' electricity bills would increase by 0.3 percent in 2009 to 1.3 percent in 2018. The average PSNH residential customer could expect to pay \$0.26 more per month in 2009 and \$1.30 in 2018. For the other New Hampshire utilities, their customers' electricity rates would decrease by 0.2 percent in 2009 and decrease by 0.3 percent in 2018. The average other New Hampshire utilities residential customer could expect to save \$0.19 per month in 2009, and save \$0.27 in 2018.

If New Hampshire chose to use 100 percent of auction revenue to invest in energy efficiency for utility customers, PSNH customers' electricity bills would increase by 0.9 percent in 2009 but decrease 1.4 percent by 2018. The average PSNH residential customer could expect to pay \$0.87 more per month in 2009, but save \$1.37 by 2018. For the other New Hampshire utilities, their customers' electricity rates would increase by 0.5 percent in 2009 and decrease by 1.7 percent by 2018. The average other New Hampshire utilities residential customer could expect to pay \$0.48 more per month in 2009, but save \$1.70 by 2018.

Therefore a key finding of the UNH study is that, over the long term, New Hampshire electric rate payers' costs will decrease if New Hampshire participates in RGGI, auctions allowances, and invests the auction revenues in energy efficiency.

2.4 How is PSNH's source of generation, namely 70 percent from their own plants and some potential bi-lateral contracts, accounted for in the UNH Study?

PSNH's CO₂ compliance costs will result from two sources – purchase of allowances necessary to operate their own generating facilities and the wholesale market purchase of power already reflecting the increased cost of carbon as described above. The UNH analysis observed that from 2003-2005, PSNH appears to have a reasonably consistent annual generation from their own fossil fuel-based power plants. Given the fact that PSNH has to purchase additional power in the wholesale electricity markets to meet its retail customer load, UNH concluded that PSNH is running its fossil fueled power plants at approximately the highest level it can to meet its own customer demand. The UNH analysis used 6.2 million Megawatt hours (MWH) as the amount of power generated from the PSNH-owned plants annually.

In the UNH analysis, the PSNH plants subject to RGGI were estimated to produce 6.5 million tons of carbon dioxide emissions annually. The number of allowances PSNH would need to purchase under RGGI was based on the maximum CO₂ emissions observed for 2000-2006 from the EPA Clean Air Markets database for each RGGI-eligible unit, minus the maximum emissions from the Schiller boiler associated with the Northern Wood Project. (Note: the Northern Wood Project involved converting a 50 MW coal boiler to a 50 MW wood boiler in 2006).

Given the extent to which bilateral contracts involve facilities for which the costs of CO₂ compliance passed on to PSNH are less than the cost of CO₂ compliance for marginal generating units setting the current, variable wholesale electric rate in the New England energy market, these contracts would serve to reduce the estimated cost of RGGI to PSNH from the wholesale electricity market. If this were the case, the actual cost to PSNH regardless of whether or not New Hampshire joins RGGI would be slightly lower than that reported in the study. This difference in costs is not expected to be significant and does not change the findings of the UNH study.

2.5 Explain the statement in the UNH Study "The costs of RGGI will primarily be borne by ratepayers no matter how carbon dioxide allowances are allocated."

The cost of carbon dioxide allowances is expected to be passed through from affected generators and then reflected in their wholesale power prices. Generally, a generator's bid price in the wholesale electricity market will include the incremental cost of fuel, operation and maintenance, and emissions

allowances. A generator will include in its bid price the value of the emissions allowances that would be expended when generating electricity, even if the generator has received the allowances at no cost. Previous cap and trade programs such as the Acid Rain and NO_x Budget programs were developed prior to the development of competitive wholesale electricity markets and the widespread advent of electricity restructuring. These programs were developed in the context of cost-of-service regulatory regimes. Under cost of service regulation, public utility commissions could prevent integrated electric power companies from passing on the "opportunity cost" of grandfathered allowances to electricity ratepayers.

In contrast, RGGI is being developed in a restructured region with competitive wholesale electricity markets. In a competitive wholesale generation market, economic theory and historical experience has shown that generators will pass on the value of allowances as a cost of generation, whether these allowances are allocated at no cost or generators are required to purchase allowances in the market. Regulators do not have the authority to prevent such an outcome in a restructured electricity sector. Because the value of allowances is included as a cost in a generator's bid into the wholesale market, the realized wholesale price of electricity would be the same whether the allowances were distributed at no cost to generators or generators were required to purchase the allowances.

2.6 Why is it in the economic interests of New Hampshire to join RGGI?

Regional Economic (REMI) Model simulations identified that the best overall economically efficient use of the auction revenue would be to fund energy efficiency and/or reduce marginal business taxes in the state. By 2018, if allowance revenue were to go strictly to energy efficiency, the overall economic affect would be to increase the state's employment by 815 and economy by \$63 million (or 0.06 percent of total annual GSP). If 100 percent of the auction revenue were used to reduce business taxes, the overall economic affect would be to increase the state's employment by 673 and economy by \$100 million (or 0.1 percent of total annual GSP), even when taking into account the increased cost of electricity due to RGGI.

If New Hampshire were not to join RGGI, the overall economic impact would be slightly negative, as the state's employment would be reduced by 72 and overall economic activity would be reduced by \$6.5 million (or 0.006 percent of total annual Gross State Product) by 2018.

2.7 Couldn't a New Hampshire generator be at a competitive advantage if it didn't have to buy allowances and therefore could negotiate bi-lateral contracts with lower prices than generators in RGGI states?

Yes, however that advantage would come at a cost to ratepayers. As discussed above, all New Hampshire rate payers will be affected to some degree by RGGI whether or not New Hampshire participates in the program. New Hampshire generators could be at a competitive advantage if they didn't have to buy allowances, but the New Hampshire rate payer would still be impacted from RGGI being implemented in the region because regional energy prices will still increase. The most significant way to mitigate those impacts would be by auctioning allowances and using the revenues to reduce energy costs by direct rebates or investing in energy efficiency.

The state's two merchant natural gas generating plants (Granite Ridge in Londonderry and Newington Energy in Newington), selling into the deregulated competitive market, are expected to be able to sell power at a competitive price regardless of whether New Hampshire participates in RGGI. The utilization of these plants has increased as the region's power demands have increased. Therefore these plants would be expected to reach greater capacity utilization regardless of RGGI.

2.8 If New Hampshire doesn't join RGGI, wouldn't generators want to locate in New Hampshire because they wouldn't have to buy RGGI allowances, therefore providing economic development to the State?

The economic factors for siting new generation facility will be far more dependent on factors other than RGGI, such as the ease of siting and permitting, location of fuel sources, transportation costs of fuel, and construction costs. RGGI is expected to only add 1 percent to 3 percent to the wholesale cost of natural gas electric generation, while other factors such as fuel costs and capacity costs are far more significant in the consideration of building new generation. For the same reasons, it is also considered unlikely that New Hampshire not participating in RGGI would result in significantly increased construction of new fossil fueled plants in New Hampshire.

2.9 How would the use of bi-lateral contracts by New Hampshire utilities affect the conclusions of the UNH study?

Bilateral contracts are agreements between wholesale buyers and sellers for electricity under set prices that may be significantly different from real-time market prices. Bilateral contracts were not considered in determining the cost of RGGI for the UNH study. This is not reflective of their importance, as they are estimated to account for 50 percent to 75 percent of all power transactions in the New England energy market. However the study could not account for the price difference as these are private contracts and the pricing and terms are not publicly available.

Public comments regarding the study have suggested that the cost impact of RGGI to utility customers, whether or not New Hampshire participates, may be less than reported in this study because this study bases the cost increase of RGGI on the cost of compliance for marginal, rate setting power producers. This argument is based on the premise that marginal producers set real time market prices in the New England energy market.

The actual cost of CO₂ compliance, depending on the underlying power generation source, may be significantly different from that of marginal generating units. An alternative methodology for determining the cost of RGGI in the wholesale electricity markets would be to use the average cost of carbon dioxide compliance for the region, as opposed to marginal. It is fully anticipated that generators will pass on the costs associated with RGGI and an average cost approach would be more reflective of actual generator cost.

If the UNH study had used average cost rather than the marginal cost approach for determining the cost of RGGI for New Hampshire, the cost to utility customers would be 28 percent lower if New Hampshire were not to participate and 12 percent lower if New Hampshire were to participate in RGGI, as shown in the tables below. This does not change the finding that overall costs to New Hampshire are lower if New Hampshire joins RGGI.

New Hampshire RGGI Marginal Cost (\$2007 Millions)

	No RGGI			RGGI			percent Difference between Scenarios
	Cost of RGGI to Utility Customers	Allowance Revenue	Net Difference	Cost of RGGI To Utility Customers	Allowance Revenue	Net Difference	
2009	(\$7)	\$0	(\$7)	(\$20)	\$17	(\$3)	-60 percent
2012	(\$15)	\$0	(\$15)	(\$41)	\$35	(\$6)	-60 percent
2015	(\$25)	\$0	(\$25)	(\$62)	\$50	(\$13)	-50 percent
2018	(\$36)	\$0	(\$36)	(\$88)	\$62	(\$26)	-30 percent

New Hampshire RGGI Average Cost (\$2007 Millions)

	No RGGI			RGGI			percent Difference between Scenarios
	Cost of RGGI to Utility Customers	Allowance Revenue	Net Difference	Cost of RGGI To Utility Customers	Allowance Revenue	Net Difference	
2009	(\$5)	\$0	(\$5)	(\$18)	\$17	(\$1)	-80 percent
2012	(\$11)	\$0	(\$11)	(\$37)	\$35	(\$2)	-80 percent
2015	(\$18)	\$0	(\$18)	(\$57)	\$50	(\$7)	-60 percent
2018	(\$26)	\$0	(\$26)	(\$78)	\$62	(\$16)	-40 percent

One of the goals of the UNH Study was to provide reasonable, yet conservative estimates of the costs associated with RGGI. It is the position of the UNH Study researchers that bilateral contacts may indeed result in slightly lower costs than presented. This provides an even stronger argument to join RGGI. The revenue from allowances allocated to New Hampshire would be expected to be the same regardless of the costing approach and the cost to participate in RGGI would be less than a marginal cost approach. This would provide an even greater financial benefit to the State than assumed in the UNH analysis.

2.10 What did UNH assume for future emission levels from existing New Hampshire power plants and how many allowance purchases were projected?

As stated by UNH in the report, PSNH's emissions peaked at 6.3 million tons in 2003, and were lower in all other years. If actual New Hampshire statewide power plant carbon dioxide emissions are lower

than 8.62 million tons in the initial years, then New Hampshire power plants could bank allowances for future use. Bonus allowance allocations (2.1 million tons per year during the initial years) to PSNH to transition from the existing New Hampshire Clean Power Act to RGGI create an additional opportunity for banking. Additional energy efficiency projects and slight changes in dispatch could also reduce emissions in the outer years. For example, if future oil prices are high relative to natural gas prices as projected by RGGI modeling, then PSNH's Newington Station could be dispatched significantly less than it was in 2003. As stated above, offsets could provide additional compliance flexibility and re-evaluation of emission levels could be made as part of the 2012 review. Previously banked allowances by PSNH from the existing Clean Power Act will be converted to RGGI allowances and granted to PSNH at approximately 2.1 million per year until the bank is depleted. Therefore, in the first years of the program, the projected allowance purchases for PSNH are less than 5.4 million allowances per year, the existing Phase I cap level in the New Hampshire Clean Power Act (RSA 125-O).

2.11 What other recent economic studies have been done and do they agree with the UNH study?

The following studies were reviewed by the UNH researchers. The analyses and conclusions in these studies are consistent with the UNH Study.

- Compensation Rules for Climate Policy in the Electricity Sector, Resources for the Future, July 2007
- Economic and Energy Impacts from Maryland's Potential Participation in the Regional Greenhouse Gas Initiative, Center for Integrated Environment Research, University of Maryland, January 2007
- New England Electricity Scenario Analysis: Exploring the economic, reliability, and environmental impacts of various resource outcomes for meeting the region's future electricity needs, ISO New England, August 2007
- Updated Reference, RGGI Package - 10/11/06, PowerPoint posted on RGGI web site, May 2007
- Who Gains And Who Pays Under Carbon-allowance Trading? The Distributional Effects Of Alternative Policy Design, Congressional Budget Office, June 2000
- Illinois economic analysis of cap & trade including joining RGGI (September 2007)

3. Questions Relative to Allowance Allocation/Auction and Offsets

3.1 Why are RGGI states, including New Hampshire, considering auctioning allowances?

The RGGI Memorandum of Understanding (MOU) establishes a regional emissions budget (the cap), and apportions the emissions budget among participating states. Each participating state can allocate allowances up to the amount of its emissions budget, with each allowance allowing a regulated source to emit one ton of CO₂. While the MOU sets certain requirements for allowance allocation, participating states are given broad discretion in how they allocate their own allowances.

Historically, cap-and-trade programs, such as federal trading program for sulfur dioxide emissions under acid rain legislation, have allocated allowances directly to regulated emissions sources based on

historic operation, a practice commonly referred to as "grandfathering." The RGGI MOU and model rule specifies that participating states will allocate a minimum of 25 percent of allowances to support a "consumer benefit or strategic energy purpose," referred to generally as a "consumer benefit allocation." For most states, these allowances would not be allocated directly to electric generators but instead would be sold at auction, with the proceeds going to benefit consumers. Generators would be required to purchase allowances, possibly through a regional auction. The revenue from the sale of these allowances could then be used to provide programmatic support for such measures as energy efficiency or clean energy technologies, which would reduce the overall compliance costs of the program and its impact on electricity ratepayers. It was anticipated in the original MOU that states would auction a minimum of 25 percent of their allowances, but currently all of the RGGI states are anticipating auctioning 100 percent of their budgeted allowances.

A consumer benefit allocation approach made possible by auctioning allowances is warranted by the deregulation of the electric power sector, as well as fundamental differences between a cap-and-trade program for carbon dioxide versus other pollutants. As described above, a generator will include in its bid the value of the emissions allowances that would be expended when generating electricity, even if the generator has received the allowances at no cost. Because the value of allowances is included as a cost in a generator's bid into the wholesale market, the realized wholesale price of electricity is the same whether the allowances are distributed to generators at no cost or they must purchase the allowances. Grandfathering allowances, therefore, results in a significant transfer of assets from ratepayers to electric generators without lowering the impact of an emissions cap on wholesale electricity prices.

A consumer benefit allocation approach is also critical to the success of the RGGI program. No cost-effective end-of-stack controls are currently available to limit CO₂ emissions. As a result, a CO₂ cap-and-trade program will benefit from having strong energy efficiency or technology development programs integrated into its design. A consumer allocation approach allows RGGI to adopt both a supply-side (electricity generation) and demand-side (electricity use) focus, thus facilitating the achievement of emissions reductions at least cost.

3.2 What is meant by "banking of allowances"?

Allowances may be purchased and held for an indefinite amount of time before being used to satisfy a compliance obligation. In other words, a power plant subject to RGGI could purchase more allowances than it needs in the first three-year compliance period and hold the additional allowances until the subsequent compliance period.

3.3 If less than 100 percent of the allowances get auctioned, because not all of the bids meet a minimum reserve price, then could the economic impacts be higher than predicted?

While the design of a recommended regional auction is not yet completed, this is not anticipated to be a likely scenario. If a reserve price (minimum price for a bid to be accepted) is utilized, it will be set below the expected price of allowances. Since auction frequency will likely be quarterly, if some allowances remain unsold in any given auction, then those would be carried over and sold at a later auction. Participants would likely bid slightly higher than the reserve price in the next auction to eventually get all of the allowances into the market. The anticipated reserve price would only be 10

percent below the allowance prices (e.g., \$2 in 2009 used in the study), so if bids are below the reserve price, then the costs to ratepayers would be even less than predicted.

3.4 Will there be an adequate supply of commercially viable offsets ?

The RGGI state agency staffs analyzed potential offsets supply at the regional level and found it to be adequate and relatively easy to develop. Commercial viability has already been demonstrated for most of the eligible offset project types (e.g., landfill gas flares, sulfur hexafluoride capture, etc). The market will determine how many offset projects are developed. If offset related allowances are cheaper than the auction price for budgeted allowances, then offset projects will be developed. As forecast by Point Carbon (a research and consulting firm on global power, gas and carbon markets) and referenced in the UNH Study, however, the auction price for budgeted allowances in the initial years of the program may be low, due to oversupply, since emissions are projected to be below the cap.

In that case, offset projects may not happen as quickly as they otherwise would have if allowance prices were high. In that scenario offsets won't be needed, because of the abundance of relatively cheap budgeted allowances. Offsets are also only one of many compliance options. Demand may increase in the outer years of the program when the budget tightens. Since banking of allowances is unlimited, offset project sponsors would be wise to develop projects now in anticipation of selling the allowances later at a higher price. The program includes a 2012 review, and an opportunity for amendment if offset supply is deficient and allowance prices soar.

3.5 How did over-allocation impact the European Union (EU) Emissions Trading Scheme (ETS) and how does this relate to RGGI?

In advance of the EU ETS emissions reporting date, companies feared that there would not be enough allowances available to cover emissions, and prices spiked to 30+ Euros. When actual emissions became known and were less than the cap, allowance prices dropped. The major reason EU allowance prices plummeted to less than one Euro was that banking (holding unused allowances for later compliance deadlines) was not allowed from Phase I to Phase II of the EU ETS. Phase II EU allowance prices are currently about 21 Euros (\$1.40 per Euro or approximately \$30). While similar in some aspects (e.g., over-allocation driving down allowance prices), RGGI is different from the EU ETS. The RGGI cap level is not as stringent as the EU ETS, and thus RGGI allowance prices should be much lower. Banking is allowed under RGGI, and RGGI allowance prices should not approach zero because they can be carried over for future use.

Another RGGI compliance flexibility mechanism is the use of offset allowances, which should also help to ensure that RGGI prices remain low. If RGGI prices do go above certain trigger levels (\$7 and \$10), then offset use is further expanded increasing the availability and driving down the allowance price. Thus, while the EU ETS could be used, under certain conditions, as an indicator of trends in allowance prices, the absolute prices for allowances under RGGI should be very different from those of the EU ETS. Finally, extensive regional modeling of RGGI was conducted based on reasonable regional scenario assumptions, including implementation of Renewable Portfolio Standards (RPS). The modeling indicates that implementation of RPS in the region should significantly reduce the amount of allowances needed for RGGI compliance. Modeling based on the actual characteristics of the RGGI

regional energy market is a better indicator of predicted allowance prices for RGGI than the EU ETS market.

3.6 How will investment in renewable energy facilities reduce the cost of RGGI allowances?

According to the Independent System Operator (ISO) of the New England energy market, natural gas facilities are the most likely to be built to meet future electricity demand growth. While lower emitting than coal-fired facilities, natural gas facilities do emit carbon dioxide, and corresponding emissions increases would occur. If a Renewable Portfolio Standard (RPS) encourages zero-emitting renewable energy facilities to be built instead of some of the new fossil fuel-fired facilities, then emissions rates would subside and less RGGI allowances would be needed for compliance, thereby increasing the available supply of allowances and reducing the market cost of allowances.

3.7 Will there be enough allowances available for power plants if non-utility purchasers buy the allowances at the auction?

Some fear that market speculators with large financial capital will buy all the allowances at the auction and resell them later at a higher price. Generally, investment firms are risk averse, and they typically want to see an established market before they enter. A regional auction, for those states with RGGI in place, may occur as early as mid-2008 for one quarter of the annual regional budget. Thus, there will be plenty of time for regulators to intervene, if a trend of this nature starts to occur. It is highly unlikely that environmental organizations or institutions will have appreciable amounts of funding to buy significant quantities of allowances. Also, sources in non-RGGI states are highly unlikely to purchase RGGI allowances, because programs in other states are not as far along in the development process as RGGI states, and currently RGGI is not linked to other programs.

3.8 What are the administrative costs and broker costs for an auction?

Broker costs are typically included in the projected allowance prices. Administrative program costs for a regional auction are projected to be \$1,000,000 for start-up and \$250,000 per year thereafter. Should New Hampshire participate, New Hampshire's share of the cost is 4.6 percent, or \$46,000 initially and \$11,500 thereafter.

4. Questions relative to the Greenhouse Gas Emissions Reduction Fund

4.1 The RGGI bill proposes to use any revenues from auction of allowances for additional investment in energy efficiency. Are there significantly more energy efficiency improvements to be addressed in New Hampshire that are not being addressed by the existing programs?

UNH did not conduct a separate analysis of the economically achievable energy efficiency potential for the State. There is, however, a significant body of research (see references below as examples) that suggests there are considerable opportunities for additional energy efficiency measures for residential and commercial customers, beyond what is currently being done. It does appear that initial capital cost is a significant consideration that has limited more widespread adoption of energy efficiency measures.

Anecdotally, the researchers in the UNH Study have noted that in their work with New Hampshire businesses throughout the state in the past year, they have noted opportunities for additional energy efficiency measures, specifically in the area of lighting.

Reports:

Optimal Energy, Inc. *The Economically Achievable Energy Efficiency Potential in New England*. Prepared for Northeast Energy Efficiency Partnerships, Inc. May 2005. This study shows that over 8,000 MW of cost effective achievable energy efficiency potential is available in the region before 2020. See <http://www.neep.org/newsroom/reports.html>

GDS Associates, *Vermont Electric Energy Efficiency Potential Study*, Final Report January 2007, Prepared for the Vermont Department of Public Service. See <http://publicservice.vermont.gov/>

4.2 How can investment of auction revenues into energy efficiency be seen as a "hedge" against the regional market?

Overall reduced demand provides a “hedge” against increased prices in the regional market by reducing the amount of power needed to meet load. Any investment in energy efficiency reduces demand for electricity which in turn reduces the likelihood that new capacity would need to be built to meet demand. Investment in new capacity to meet growth (i.e., without energy efficiency measures) would increase regional energy prices particularly if the new capacity was only needed to meet the small amount of time peak demand is greater than current capacity. For PSNH which owns a significant portion of its own generation, reduced demand reduces the amount of power PSNH must obtain from the regional market and, therefore, reduces costs to its customers.